

REMARKS

Examiner H. Vu is thanked for the thorough examination and search of the subject Patent Application. Claims 21-30 have been amended and new Claims 32-41 have been added.

Reconsideration of the rejection of Claims 22-30 under 35 U.S.C. 112, second paragraph, is requested in view of amended Claims 22-30. Claims 22-30 have been amended to correct their dependency.

The claims have been amended to correct typographical errors. New claims 32-41 have been added. New claim 32 specifies that the interface layer is only on the sidewalls of the upper interconnect as shown in Figs. 5 and 6. No new matter has been added.

All Claims are believed to be in condition for Allowance, and that is so requested.

Reconsideration of the rejection under 35 U.S.C. 103 of Claim 21 as being unpatentable over Mori et al in view of Kawaguchi is requested in view of amended Claim 21 and in accordance with the following remarks.

Claim 21 has been amended to refer to the interconnect structure rather than to the interconnect opening.

It is discussed on page 2 of the Specification that a barrier metal layer, such as the tantalum nitride layer 32 of Mori et al (Fig. 13, col. 8, lines 53-55), is optional in the process of Applicants' invention. It is agreed that Kawaguchi discloses copper sulfide to prevent oxidation of copper. This has nothing to do with Applicants' invention of using copper sulfide to prevent copper diffusion from a lower interconnect 12 into the dielectric sidewalls of the upper interconnect opening 30 (see Fig. 3A). Kawaguchi does not disclose a lower interconnect. The copper line 9 of Kawaguchi is formed over an insulating layer 2 (Fig. 2, col. 3, lines 59-62). There would be no motivation to use the copper sulfide oxidation prevention layer of Kawaguchi in place of the barrier layer of Mori et al since these two references disclose different structures. Kawaguchi discloses a copper line surrounded on all sides by a copper sulfide oxidation prevention layer. The copper line is formed on an underlying insulating layer. Mori et al discloses an upper interconnect formed on the lower interconnect. It is only with reference to Applicants' own disclosure that it can be seen that copper sulfide can replace the barrier layer of Mori et al on the sidewalls of the upper interconnect. Applicants' invention is not taught or suggested by either of the references or their combination.

Reconsideration of the rejection under 35 U.S.C. 103 of Claim 21 as being unpatentable over Mori et al in view of Kawaguchi is requested in view of amended Claim 21 and in accordance with the remarks above.

Allowance of all Claims is requested.

It is requested that should Examiner Vu not find that the Claims are now Allowable that the Examiner call the undersigned at 765 4530866 to overcome any problems preventing allowance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Rosemary L. S. Pike".

Rosemary L. S. Pike. Reg # 39,332